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10/024,393	12/21/2001	Keiji Saisho	011730	5836

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EXAMINER

CANTELMO, GREGG

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 09/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding. -

# Office Action Summary

Application No.

10/024,393

Applicant(s)

SAISHO ET AL.

Examiner

Gregg Cantelmo

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

2. The information disclosure statement filed July 11, 2002 has been placed in the application file and the information referred to therein has been considered as to the merits.

### ***Drawings***

3. The drawings received December 21, 2001 are acceptable for examination purposes.

### ***Claim Interpretation***

4. Claims 7-9 and 19 recite a range within a range. While a preferable range is recited in the claims, the claims have been interpreted in light of the broadest range set forth therein. In the instant case, to an upper limit pore diameter of 100 microns.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

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art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-6 and 16-18 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a range of pore diameters from 5 microns to 100 microns, does not reasonably provide enablement for a diameter of 5 microns or greater. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims. The instant application is not held to be enabling an open-ended range of pore diameters. It is evident from the disclosure that the lower limit of the pore diameter is 5 microns and the upper limit of the pore diameter is 100 microns. Pore diameters in excess of this will result in significant short circuiting of the cell and fail to provide an effective operating battery.

Note this does not applied to claims 7-15, 19 and 20 because these claims define upper and lower bounds of the pore diameters within the enabled ranges disclosed in the instant application.

### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-16 and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent No. 5,453,333 (Takauchi).

Takauchi discloses a nonaqueous electrolyte secondary cell comprising a positive electrode, a negative electrode, a nonaqueous electrolyte, a separator interposed between the positive electrode and the negative electrode, the positive electrode having a positive electrode active material comprising a chemical compound capable of reversibly intercalating lithium and the negative electrode having a negative electrode active material comprising a material capable of reversibly intercalating lithium, wherein the separator has through holes for passing lithium dendrites therethrough (abstract, Figs. 1-3 and col. 10, ll. 18-27 as applied to claims 1 and 18).

The degree of straight-line is not specified in claim 2, at least a cross-sectional portion of any number of pores in the prior art will inherently have a straight-line shape.

The through holes are such that the positive and negative electrodes are connected in the shortest possible thickness. In particular the holes shown in the figures can be applied to a separator having the shortest thickness of 15 microns (Figs. 1-3 and paragraph bridging columns 10 and 11 as applied to claim 3).

The holes have an average pore size of up to 10 microns (col. 10, ll. 18-27 as applied to claims 1, 4-15 and 18-20).

The density of the pores is from 30 to 80% of the separator (col. 9, ll. 51-56). The average pore size is at most 10 microns. In a given square centimeter cross-section of the separator, 30-80% of the surface of the separator will have pores. Given that the maximum average pore size of 10 microns there is a reasonable expectation that the prior art inherently has at least one through hole per square centimeter or more (as applied to claim 16).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi in view of U.S. patent No. 5,681,357 (Eschbach).

The teachings of claim 1 with respect to Takeuchi have been discussed above and are incorporated herein.

The difference between claim 17 and Takeuchi is that Takeuchi does not teach or suggest providing a conductive polymer provided between the separator and the electrodes.

Fig. 2 of Eschbach discloses a separator 52 having a PVDF conductive polymer layer disposed on the sides of the separator which face and contact the electrodes of the battery (See Fig. 2 and col. 4, ll. 1-30).

The motivation for providing a PVDF on the sides of the separator is that the coating serves to aid in the absorbtion of the electrolyte in the separator and upon "gelling", improve the adhesion between the separator and electrodes (col. 5, ll. 6-12).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Takeuchi by providing a PVDF on the sides of the separator since it would have aided in the absorbtion of the

electrolyte in the separator and upon "gelling", improved the adhesion between the separator and electrodes.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (703) 305-0635. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (703) 308-2383. FAX communications should be sent to the appropriate FAX number: (703) 872-9311 for After Final Responses only; (703) 872-9310 for all other responses. FAXES received after 4 p.m. will not be processed until the following business day. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gregg Cantelmo  
Patent Examiner  
Art Unit 1745

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September 16, 2003